

WHAT IS CLAIMED IS:

1. A packet voice gateway comprising:

at least one voice data port capable of connection to and communication with an access network device;

5 at least one packet data port capable of connection to and communication with a packet-based network; and

an access network interface capable of

exchanging signaling, using an access network protocol, with an access network device connected to the voice data port,

10 exchanging signaling packets, using a packet-based gateway control protocol and the packet data port, with a call agent reachable over a packet-based network, and

translating signaling between the access network protocol and the packet-based gateway control protocol, such that the gateway emulates a group of physical subscriber connections to the access network device, and such that the gateway controls the access

15 network device directly based on commands in signaling packets issued by the call agent.

2. The gateway of claim 1, wherein the voice data port is capable of receiving and transmitting voice data and signaling using a plurality of time-division-multiplexed digital-sampled channels.

20 3. The gateway of claim 2, wherein the voice data port is also capable of connection to a circuit-switched trunk, the gateway further comprising a configuration manager capable of associating the access network interface with the voice data port when that port is connected to an access network device, and capable of associating the voice data port with a trunk

interface when that port is connected to a circuit-switched trunk.

4. The gateway of claim 3, wherein the trunk interface also exchanges signaling, using the same packet-based gateway control protocol as the access network interface, with the call agent.

5. The gateway of claim 2, comprising a backplane and a plurality of circuit cards electrically connected to a backplane bus located on the backplane, the circuit cards including:

a line card comprising the voice data port, circuitry for multiplexing data from the voice data port onto the backplane bus, and circuitry for demultiplexing data from the backplane bus to the voice data port; and

a processor card comprising the access network interface, and circuitry for communicating with the line card across the backplane bus.

6. The gateway of claim 5, wherein the line card comprises multiple voice data ports, each capable of configuration for connection to either an access network device or to a circuit-switched trunk.

7. A method for processing voice calls in a packet voice gateway comprising:

tracking call status for a call connected through the access network device;

receiving at least one access network signaling message from an access network device connected to a gateway voice data port;

translating the access network signaling message into at least one packet-based

gateway control protocol message based on the call status and received access network signaling;

relaying the gateway control protocol message to a call agent.

5 8. The method of claim 7, further comprising:

receiving a gateway control protocol response message from the call agent;

translating the gateway control protocol response message into at least one second access network signaling message; and

relaying the second access network signaling message to the access network device through the gateway voice data port.

9. The method of claim 8, wherein the gateway control protocol response message is a MGCP message, and wherein the second access network signaling message is a V5/GR.303 message.

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10. The method of claim 8, further comprising updating call status for the call as messages are received from the access network device and the call agent.

11. The method of claim 7, wherein receiving at least one access network signaling message comprises gathering dialed number digits from the access network device and acknowledging receipt of those digits to the access network device, and wherein translating the access network signaling message comprises constructing a notification message, containing the dialed number digits, for forwarding to the call agent.

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12. The method of claim 7, wherein the gateway control protocol message is a MGCP message, and wherein the access network signaling message is a V5/GR.303 message.

13. A method for operating a packet voice gateway, having multiple voice data ports and at least one packet data port, comprising:

configuring at least one first active voice data port in a first configuration type, for connection to an access network device;

configuring at least one second active voice data port in a second configuration type, for connection to a circuit-switched trunk device;

exchanging signaling with the access network device using an access network protocol;

exchanging signaling with the circuit-switched trunk device using a trunking protocol;

placing call completion, for voice calls routed through the first or second voice data ports and also routed through the at least one packet data port, under the control of a call agent remote from the packet voice gateway but reachable through the at least one packet data port, the call agent communicating with the packet voice gateway using a packet-based gateway control protocol; and

for both the access network device and the circuit-switched trunk device, coordinating signaling with those devices, in their respective protocols, with call completion transactions between the gateway and the call agent via the packet-based gateway control protocol.

14. An apparatus comprising a computer-readable medium containing computer instructions that, when executed, cause a processor or multiple communicating processors to perform a method for call signaling, the method comprising:

tracking call status for a call connected through the access network device;
receiving at least one access network signaling message from an access network
device connected to a gateway voice data port;

translating the access network signaling message into at least one packet-based
5 gateway control protocol message based on the call status and received access network
signaling;

relaying the gateway control protocol message to a call agent.

15. The apparatus of claim 14, the method further comprising:

receiving a gateway control protocol response message from the call agent;
translating the gateway control protocol response message into at least one access
network signaling message; and

relaying the access network signaling message to the access network device through
the gateway voice data port.

16. The apparatus of claim 15, the method further comprising updating call status for the call
as messages are received from the access network device and the call agent.